



# TCS Digital Skin Twin Platform

Research & Innovation



While the cosmetics and pharmaceutical industries have been receptive to emerging technologies to reduce costs and augment operational efficiency, product testing and delivery are two key areas where they have been adversely affected. The ban on the use of animals for cosmetics testing and difficulties in safely breaching the skin barrier for transdermal drug delivery applications further impedes the ability of enterprises to evaluate and create more advanced healthcare and personal care products.

The TCS Digital Skin Twin Platform has been specifically built for the growing needs of these two industries. Our multiscale modeling platform is designed to accelerate the development of healthcare and personal care products.

## Overview

Historically, the pharmaceutical and cosmetics industries have had problems trying to reduce the time taken to introduce new drugs into the market and producing cosmetics in a more ethical fashion, respectively. Both these industries deal with a number of highly sensitive factors, such as the use of animals in the testing process as well as the lives of patients afflicted with debilitating diseases. It is hardly a surprise that these industries have been in search of new modes of testing – preferably in-silico, or organ-on-chip testing – to assist in-vivo/in-vitro experiments.

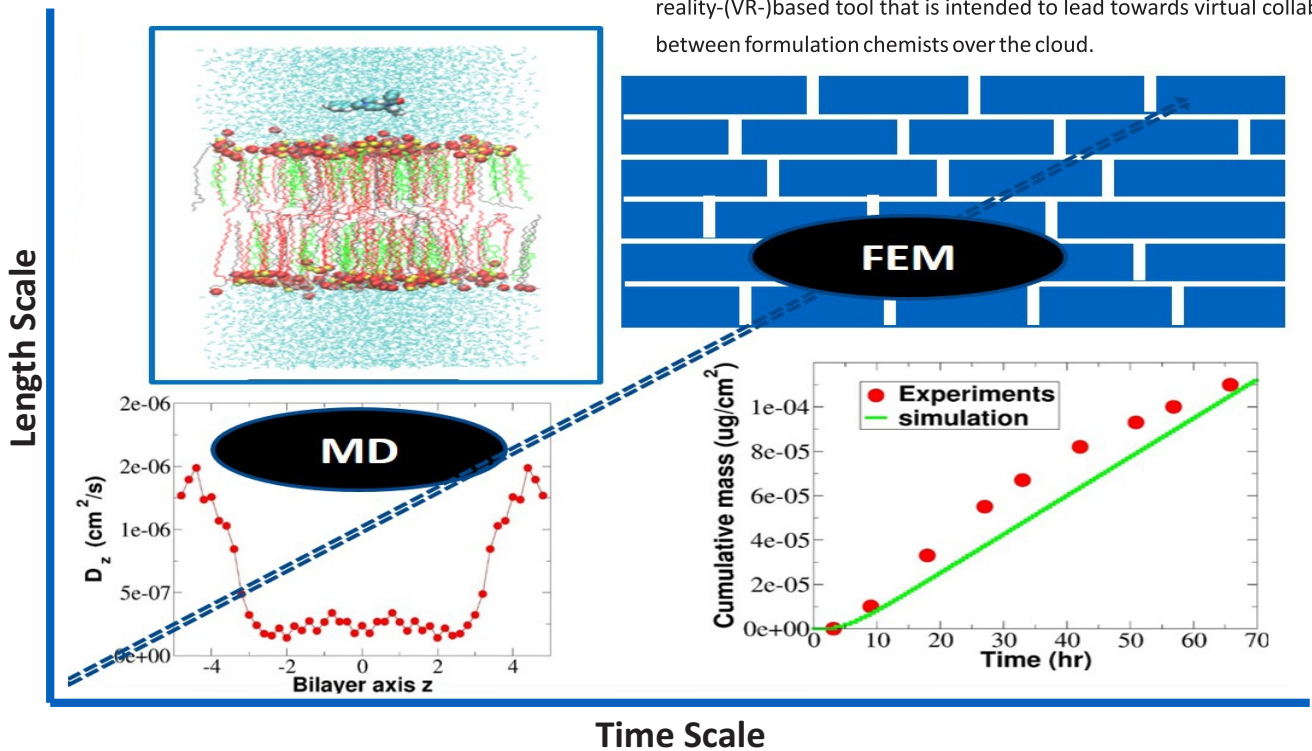
A multiscale modeling platform can aid in-vivo/in-vitro tests and adjust to the strict regulations against animal testing in multiple geographies. In this regard, TCS' platform is not only aimed at augmenting current testing processes, but also at meeting stringent regulatory requirements, streamlining operations, and leveraging advanced techniques to design new healthcare and personal care products.

## Solution

The TCS Digital Skin Twin Platform utilizes multiscale modelling and advanced visualization techniques that capture the physicochemical properties of human skin, thereby creating a digital twin that helps researchers study the transport of constituents of formulations through skin. From micro- and macro-scale modeling through molecular dynamics and computational fluid dynamics simulations, to ushering in nanoparticle design, the solution can enhance the current developmental processes by a significant margin.

The digital skin twin thus can be used for in-silico testing of transdermal delivery of pharmaceuticals and cosmetics. The extensive validation of this digital twin with real skin in-vivo/in-vitro experiments done at TCS COIN™ partners and scientific collaborators supports its suitability in the replacement of conventional experiments with in-silico tests. The platform has also been tested for the response of skin under various external conditions such as electroporation.

The solution also uses advanced visualization techniques through a virtual reality-(VR)-based tool that is intended to lead towards virtual collaboration between formulation chemists over the cloud.



In-silico testing of pharmaceutical molecule using TCS' digital skin twin platform







## Benefits

The TCS Digital Skin Twin Platform is bundled with cutting-edge formulation design, testing, and visualization capabilities to:

- Test new cosmetics formulations without involving animals in the process
- Utilize in-silico screening of formulations for transdermal drug delivery
- Aid development of new compounds and formulations via an in-depth understanding of transport across human skin layers
- Accelerate formulation design and, consequently, time-to-market while reducing costs
- Leverage an ever-expanding search space for continuous development
- Design skin-friendly patches for wound healing, anti-smoking, pain relief, etc.
- Provide better understanding for futuristic solutions such as emotive robo-skin
- Offer a virtual avenue for collaborative formulation design

## The TCS Advantage

**Multifaceted expertise:** The availability of experts across numerous domains at TCS ensures that the TCS Digital Skin Twin Platform framework can provide a robust combined multiscale approach for modeling

**VR implementation:** Not only does VR use ensure that the framework leverages a highly advanced means of visualizing pharmaceutical and cosmetic formulations, but it will also aid in obtaining deeper insights for our clients. This will lead to a more collaborative design process

**HPC center:** At TCS, we leverage a high performance computing center for complex simulations and data processing



## Awards & Recognition



### To know more

Visit the [Research and Innovation](#) page on [tcs.com](#)  
Email: [innovation.info@tcs.com](mailto:innovation.info@tcs.com)

### About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

For more information, visit us at [www.tcs.com](#)

[IT Services](#)  
[Business Solutions](#)  
[Consulting](#)

All content / information present here is the exclusive property of Tata Consultancy Services Limited (TCS). The content / information contained here is correct at the time of publishing. No material from here may be copied, modified, reproduced, republished, uploaded, transmitted, posted or distributed in any form without prior written permission from TCS. Unauthorized use of the content / information appearing here may violate copyright, trademark and other applicable laws, and could result in criminal or civil penalties.

Copyright © 2018 Tata Consultancy Services Limited